



City of Raleigh
Public Utilities Department

CROSS CONNECTION PROGRAM



City of Raleigh
Cross Connection Ordinance
Article D. Water Quality Protection
8-2141--8-2156

- Sec 8-2141 Definitions
- Sec 8-2142 Compliance with Federal and State Law
- Sec 8-2143 Unlawful Connections
- Sec 8-2144 Inspection of Property
- Sec 8-2145 Right of Access
- Sec 8-2146 Existing Conditions
- Sec 8-2147 Hazardous Uses
- Sec 8-2148 Other Connections
- Sec 8-2149 Installation of Containment Devices
- Sec 8-2150 New Construction
- Sec 8-2151 Notification of Consumer
- Sec 8-2152 Change in Nature of Use
- Sec 8-2153 Consumer Responsibilities
- Sec 8-2154 Testing and Maintenance of Devices
- Sec 8-2155 Enforcement by Civil Penalty
- Sec 8-2156 Limitation of Liability

ARTICLE D. WATER QUALITY PROTECTION*

*Editor's note: Ord. No. 1987-20, §1, adopted July 21, 1987, effective Sept. 30, 1987, added provisions designated as §§8-2013--8-2028. At the direction of the City, these provisions have been redesignated as Art. D, §§8-2141--8-2156, as herein set out.

Sec. 8-2141. DEFINITIONS.

As used in this article, the following terms *shall* have the meanings provided in this section unless the context clearly indicates otherwise.

Air-gap separation . An unobstructed vertical distance through the atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. An approved air-gap vertical separation *shall* be at least double the diameter of the supply pipe. In no case *shall* the air-gap be less than one (1) inch.

Approved . Certified *in writing* by the Director of Public Utilities as an acceptable device or methodology for the purpose of backflow prevention.

Auxiliary intake . Any piping connection or other device whereby water *may* be secured from a source other than public water supply.

Backflow . Any flow of water into the public water supply from any other source due to a cross-connection, auxiliary intake, interconnection, backpressure, backsiphonage, any combination thereof, or other cause.

Backpressure . Any pressure on any source of water other than the public water supply which *may* be greater than the pressure on the public water supply and *may* result in a backflow.

Backflow prevention device . An approved effective device or method used to prevent backflow from occurring in the potable water supply. The type of device required *shall* be based on degree of hazard, existing or potential.

Backsiphonage . Any circumstance in which the pressure on the public water supply *may* be reduced to the point that the elevation and atmospheric pressure on a source of water other than the public water supply *may* result in a pressure to be greater than the pressure on the public water supply and *may* result in a backflow.

Certified tester . A *person* who has proven his/her competency to test, repair, overhaul and make reports on backflow prevention devices as evidenced by certification of successful completion of a training program approved by the Director of Public Utilities.

Confinement device . A backflow prevention device, as approved and required, installed within a private plumbing or distribution system to isolate a localized hazard from the remainder of said system.

Consumer . Any *person*, firm, or corporation responsible for any *property* at which water from the City of Raleigh public water supply is received. In the absence of other parties or the failure of other parties to accept the responsibilities herein set forth, the *owner* of record *shall* be ultimately responsible.

Containment device . A backflow prevention device, as approved and required, installed at the point of separation between the public water supply and a private service or private distribution system or at the point of metering.

Cross-connection . Any physical connection whereby the public water supply is connected with any other water supply system, whether public or private, either inside or outside of any building or buildings, in such a manner that a flow of water into the public water supply is possible either through the manipulation of valves or because of ineffective check or back-pressure valves, or because of any other arrangement.

Cross-connection control coordinator . The official position established and authorized by the *City* and designated by the Director of Public Utilities to administer, interpret this section and who *shall* be a certified tester.

Double check valve backflow prevention device . An approved assembly composed of two (2) single, spring-loaded independently operating check valves, including tightly closing shut-off valves located at each end of the assembly, and having suitable connections for testing the watertightness of each check valve.

Dual check valve . An approved device containing two (2) independently acting check valves in series.

Experimental backflow preventor . Any new or existing containment device or methodology of backflow prevention that is not currently approved and certified by the City of Raleigh Public Utilities Department. Requires at a minimum approval from the University of Southern California Foundation for Cross Connection Control and Hydraulic Research Laboratory for consideration for field installation and use. Only then by specific *written* approval by City of Raleigh Public Utilities Department.

Fire line . A system of pipes and equipment used to supply water in an emergency for extinguishing fire.

Interconnection . Any system of piping or other arrangement whereby the public water supply is connected directly with a sewer, drain, conduit, pool, heat exchanger, storage reservoir, or other device which does or *may* contain *sewage* or other waste or substance which would be capable of imparting contamination to the public water supply.

Pressure vacuum breaker . An approved assembly containing an independently operating spring loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly must be equipped with suitable connections for testing the proper operation of the device and tightly closing shut-off valves located at each end of the assembly.

Public water supply . The water and waterworks system of the City of Raleigh, and its customers outside the corporate limits, for general use and which supply is recognized as the public water supply by the North Carolina Department of Human Resources.

Reduced pressure zone principle backflow prevention device (RPZ) . An approved device containing within its structure two (2) spring loaded independently operating check valves, together with an automatically operating pressure differential relief valve located between the two (2) check valves. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow the pressure between the checks *shall* be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, *shall* operate to maintain the pressure between the check valves less than

the supply pressure. This device *shall* have suitable connections for testing the proper operation of the device, including tightly closing shut-off valves located at each end of the device.

(Ord. No. 1987-20, §1, 7-21-87; Ord. No. 1992-3, §1, 7-7-92)

Sec. 8-2142. COMPLIANCE WITH FEDERAL AND STATE LAW.

The City of Raleigh will comply with the Federal Safe Drinking Water Act, the North Carolina Drinking Water Act, and North Carolina State Building Code, which pertain to *cross-connections, auxiliary intakes and interconnections*, and establish an effective ongoing program to control potential sources of contamination of the *public water supply*.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2143. UNLAWFUL CONNECTIONS.

It *shall* be unlawful for any *person* to cause a *cross-connection, auxiliary intake*, or *interconnection* to be made; or allow one to exist for any purpose whatsoever.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2144. INSPECTION OF PROPERTY.

It *shall* be the duty, upon request of the Director of Public Utilities, of the *cross connection coordinator* to cause inspections to be made of *properties* served by the *public water supply* where *cross-connections* with the *public water supply* are deemed possible. The frequency of inspections and reinspections *shall* be set by the director of public utility.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2145. RIGHT OF ACCESS.

The Director of Public Utilities, or authorized representative, *shall* have the right to enter, at reasonable time, any nonresidential *property* served by a connection to the Raleigh *public water supply* for the purpose of performing the duties of this article. In those cases in which the *property* owner chooses not to provide such access, the Director of Public Utilities, or authorized representative, *may* designate the location as a high hazard in accordance with §8-2147.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2146. EXISTING CONDITIONS.

Any *consumer shall* be allowed ninety (90) days to correct any *cross-connections, auxiliary intakes, interconnections* or other hazard as defined by §8-2147 of this Code in violation of the provisions of this article. The ninety (90) days will be from the date of receipt of the notification given by the *cross connection coordinator*.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2147. HAZARDOUS USES.

(a) The *following* uses *shall* be classified as hazardous uses:

(1) Hazardous uses include, but are not limited to: pumps and tanks handling *sewage*, radioactive, lethal, or toxic substances, boiler and steam connections, sewer waste lines,

low inlets to receptacles containing toxic substances, coils or jackets used as heat exchangers, flush valve toilets without vacuum breaks, bacterial and viral materials, private wells or other private water supply, irrigation systems, water systems or hose connections, with booster pumps, carbonation equipment, or similar hazard potential as determined by the *cross connection coordinator* .

(2) Any location at which the nature or mode of operation within a premises are such that frequent alterations are made to the plumbing or at which there is a likelihood in the determination of the *cross connection coordinator* that protective measures *may* be subverted, altered, or disconnected.

(3) Any facility which contains, but is not limited to, a bottling plant, cannery, building having five (5) or more stories, battery manufacturer, exterminator, greenhouse, chemical processing plant, dairy, dye works, film laboratory, car wash, hospital, commercial laboratory, laundry, metal fabricating operation, mortuary, swimming pool, morgue, x-ray equipment, medical office with laboratory, aspirator, medical washing equipment, packing house, plating plant, poultry house, power plant, nuclear reactor, those fire sprinkler systems equipped with facilities for introduction of freeze preventive chemicals or other substances other than water, dental office, any radioactive material, restaurant, shopping mall with a tenant conducting any activity listed in this section and *sewage pump or treatment facilities*.

(b) All installations described in §8-2147 of this Code *shall* be deemed hazardous uses, and must have a *containment device* in the form of a *reduced pressure zone backflow prevention device* provided that, if the *consumer* demonstrates to the satisfaction of the *cross connection coordinator* that sufficient internal *confinement devices* have been installed and tested. The *cross connection coordinator* will require that the *consumer* provide engineering drawings sealed by a professional engineer of installations within the premises, which provide complete internal protection against *cross-connection* as approved by the *cross connection coordinator* . Any such connection *shall* be considered an other connection for the purpose of determining the type of *containment device* required. Each internal *confinement device shall* be one (1) of the *following* , as *approved* by the Director of Public Utilities or his authorized representative: *reduced pressure zone principle backflow prevention device, double check valve backflow prevention device, air gap, vacuum break-pressure type* , or *dual check valve* . Each *reduced pressure zone principle backflow prevention device* serving as an internal *confinement device shall* have a mesh strainer immediately upstream of the inlet gate valve.

(c) No *person shall* fill any tanks or tankers which include the *following* : those containing pesticides, fertilizers, other toxic chemicals or their residues, flush trucks, *street sweepers*, and nonpotable water tankers from a public water system except with an *approved air gap* fill or an *approved reduced pressure backflow preventor* properly installed on the tank or tanker or on the *public water supply* fill pipeline or hose.
(Ord. No. 1987-20, §1, 7-21-87; Ord. No. 1992-3, §§2-4, 7-7-92; Ord. No. 1994-306, §1, 1-4-94)

Sec. 8-2148. OTHER CONNECTIONS.

(a) Services to single-family residential units, not otherwise required by this Code to have other *containment devices* , *may* have a *containment device* in the form of an

approved dual check valve . On all such services for which meters are applied more than ninety (90) days *following* the date of adoption of this article, said *dual check valves* or other *containment devices* as required *shall* be installed by the *owner's* representative prior to the installation of the meter by the Department of Public Utilities. On all such services for which meters have been applied prior to that date, said *dual check valve* *shall* be installed by the Department of Public Utilities, provided that the *City* reserves the right to charge the *owner* or occupant of any *residence* for the cost of said device and its installation. Maintenance of *dual check valve containment devices* installed in accordance with this section *shall* be conducted by the Department of Public Utilities. Testable containment devices that are required on lawn irrigation water systems and must be tested every three (3) years by a contractor that has been approved by the City of Raleigh.

(b) All other connections to the *public water supply* of the City of Raleigh *shall* have *containment devices* in the form of a *double check valve backflow prevention device* as set forth in §8-2149 of this Code. This *shall* include water mains installed to *City* standard, and with *City* supervision, but which are not maintained by the *City* , pursuant to §8-2007, including but not limited to manufactured home parks, apartments, group housing projects, and other private distribution systems, or similar hazard potential as determined by the Director of Public Utilities, or his authorized representative. Private distribution systems [*shall* be] configured so as to provide looped mains, with two (2) or more *containment devices* on each building water service connection and at dead-end branch mains.

(Ord. No. 1987-20, §1, 7-21-87; Ord. No. 1992-3, §5, 7-7-92; Ord. No. 1998-421, §1, 10-6-98; Ord. No. 2000-734-TC-189, TC-2-00, §1, 2-15-00)

Editor's note: Section 5 of Ord. No. 1992-3, adopted July 7, 1992, amended a nonexistent §8-2148(6). The editor has included the amendment as the final sentence of subsection (b), adding the text in brackets [] for grammatical correction.

Sec. 8-2149. INSTALLATION OF CONTAINMENT DEVICES.

(a) The *containment devices* *shall* be located off *street* right-of-way on the water main side of any plumbing connections. When installed in a building, the device *shall* be located on the service line immediately after its entrance into the building. Each *containment and confinement device* *shall* be installed in a location which is physically accessible for inspection and testing as determined by the *cross connection coordinator*. *Containment devices* which have been buried in the ground do not satisfy the provisions of this Code. Each reduced pressure principal zone device is unlikely as determined by the *cross connection coordinator* .

(b) The Director of Public Utilities *shall* maintain a list of approved manufacturers and models of hazard *containment devices* and drawings of standard installations, copies to be made available through the office of the Director of Public Utilities and the Chief Inspector's office. All *reduced pressure zone principle backflow prevention devices* and *double check valve backflow prevention devices* *shall* be approved by the Foundation for Cross Connection Control and Hydraulic Research. All vacuum breaks and *dual check valve devices* *shall* be approved by the American Society for Sanitary Engineers. All installations and materials *shall* conform to *City* standards as set by the Director of Public Utilities.

(c) In those cases in which *containment and/or confinement devices* have been previously installed by prior *owners*, the *City*, or other parties, the responsibility for maintenance, testing, and replacement as applicable *shall* be with the *consumer*.

(d) The cost of said means of containment, and any other plumbing modifications necessary and convenient thereto, and the testing and maintenance thereof, is to be paid for by the *consumer*.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2150. NEW CONSTRUCTION.

All buildings proposing to connect to the public water system of the City of Raleigh receiving building permits, on or after the effective date of this article, *shall* be equipped with an *approved* and tested as properly functioning *backflow prevention device(s)*, as prescribed herein, prior to the issuance of a certificate of code compliance for that building. If a building permit was issued for the building prior to the effective date of the article, or a building permit was not required, the building *shall* be considered to be an existing building prior to the effective date, in accordance with §8-2146 of this Code.

(Ord. No. 1987-20, §1, 7-21-87)

Editor's note: The effective date of this article is September 30, 1987.

Sec. 8-2151. NOTIFICATION OF CONSUMER.

Upon identification of a hazard, or hazard potential, as defined in §§ 8-2147 through 8-2148 of this code, the *cross connection coordinator* shall notify the *consumer* of record of the *property* on which the hazard exists, of the *following* :

- (a) Location of hazard;
- (b) Nature of hazard observed;
- (c) Date hazard observed;
- (d) Section of Code applicable;
- (e) Requirements of Code.

Such notification to be made by certified mail, with return receipt requested.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2152. CHANGE IN NATURE OF USE.

The Public Utilities Department *shall* be notified by the *consumer* when the nature of use of the *property* changes so as to change the hazard classification of that *property*, as set forth in §§8-2147 through 8-2148 of this Code.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2153. CONSUMER RESPONSIBILITIES.

(a) The *consumer shall*, upon notification, as defined in §8-2151 of this Code, install the hazard *containment device(s)* as required within ninety (90) days from the date of notification.

(b) If, after expiration of ninety (90) days, the *containment device(s)* has not been installed in conformance with standards set by the Director of Public Utilities, in a proper working condition, the Director of Public Utilities *may* discontinue the *public water supply* service at that premises, and service *shall* not be restored until such devices have been installed. The Director of Public Utilities *may* permit an extension of up to ninety

(90) additional days if compliance efforts are underway and the existence of hardship can be demonstrated.

(c) The City shall bear no liability for direct or consequential damages proximately caused by the discontinuance of service pursuant to this section.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2154. TESTING AND MAINTENANCE OF DEVICES.

The consumer at each property at which containment and/or confinement device(s) have been installed, except those with devices installed in accordance with §8-2148(a) of this Code, shall have each containment and/or confinement device(s) tested on an annual basis, and perform any routine maintenance to such device as recommended by the manufacturer, and provide the cross connection coordinator with a report of that inspection and work. Backflow prevention devices that require testing must be done so with equipment approved by the City of Raleigh. The consumer shall cause such maintenance or repairs to be made, rendering the device fully operational. Failure of the consumer to perform that testing and maintenance shall be cause for the premises to be deemed an immediate public health hazard. The Director of Public Utilities may immediately thereafter discontinue public water supply service to that premises and service shall not be restored until such devices have been rendered fully operational. Where the use of water is critical to the continuance of normal operations or protection of life, property, or equipment, duplicate containment or confinement devices shall be provided by the property owner to avoid the necessity of discontinuing water service to test or repair the device or devices.

(Ord. No. 1987-20, §1, 7-21-87; Ord. No. 1992-3, §6, 7-7-92)

Sec. 8-2155. ENFORCEMENT BY CIVIL PENALTY.

(a) Penalty.

Violation of any provision of this article may subject the offender to a civil penalty to be recovered by the City in a civil action in the nature of debt if the offender does not pay the penalty within thirty (30) days after the assessment has become final by exhaustion of the appeal process established by this section, or by failure to appeal the assessment.

The civil penalty for violation of any provision of this cross connection control article shall not exceed five hundred dollars (\$500.00) per day for each day of continuous violation, or a cumulative or single civil penalty of ten thousand dollars (\$10,000.00).

The civil penalty for willful violation of any provision of this article shall not exceed one thousand dollars (\$1,000.00) per day for each day of a continuous violation, or a cumulative or single civil penalty of twenty thousand dollars (\$20,000.00).

(b) Assessment.

Any civil penalty shall be assessed by the City Manager, upon the recommendation of the Director of Public Utilities, and shall be based upon the reasonable estimated cost of correcting the cited violation, the magnitude of the potential risk posed to the public health, safety and welfare by the violation, and the cost of the public safety or other emergency response caused by the violation. The City Manager shall serve written notice of the civil penalty assessment on the offender and set out with reasonable care the basis of the amount so assessed.

(c) Equitable relief.

The provisions of this article *may* be endorsed by an appropriate equitable remedy, including a mandatory or prohibitory injunction, issuing from a court of competent jurisdiction.

(d) Enforcement option.

The penalties and enforcement provisions established by this article *may* be applied in addition to or in lieu of the penalties established by other sections of this Code.

(Ord. No. 1987-20, §1, 7-21-87)

Sec. 8-2156. LIMITATION OF LIABILITY.

The *City* *shall* not be held liable, for any cause, for failure to detect any unit failing to operate adequately, or failure to identify any specific hazard, which *may* result in contamination of its *public water supply*, nor *shall* this article diminish the responsibility of any *property* owner from whose *property* a contamination of the *public water supply may* originate.

(Ord. No. 1987-20, §1, 7-21-87)